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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,380	01/23/2006	Genichiro Ota	L9289.06101	5562
52989	7590	10/21/2010	EXAMINER	
Dickinson Wright PLLC			TIMORY, KABIR A	
James E. Ledbetter, Esq.				
International Square			ART UNIT	PAPER NUMBER
1875 Eye Street, N.W., Suite 1200				2611
Washington, DC 20006				
			MAIL DATE	DELIVERY MODE
			10/21/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,380	OTA ET AL.	
	Examiner	Art Unit	
	KABIR A. TIMORY	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 11 August 2010.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) 2,3 and 5 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1, 4, 6, and 8 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Response to Arguments

1. This final office action is in response to the amendment filed on 08/11/2010. Claims 1, 4, 6, and 8 are pending in this application and have been considered below. Claims 2-3 and 5 are withdrawn by the applicant and claim 7 is canceled by the applicant.

2. Applicant arguments regarding the rejection under 35 U.S.C. 103(a) as being unpatentable over Daoud et al. (US 4835791) in view of Muzzi et al. (US 3628155) have been fully considered but they are not persuasive. The examiner thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meets the claimed limitation as rejected.

(1) Applicant's argument: "The Office Action proposes that Daoud discloses, in Fig. 2, a single side band (SSB) modulator 30 that produces an upper side band (USB) signal (see Office Action section 5, first bullet). However, it is noted that Daoud clearly illustrates in Fig. 2 that the signal produced by SSB modulator 30 (as characterized in the Office Action) and output by summer 40 is the lower side band (LSB) signal, as indicated by the label "LSB" on the output of summer 40 (see Daoud col. 4, lines 5-11).

Similarly, the Office Action proposes that Daoud's SSB modulator 50 produces an LSB signal (see Office Action section 5, second bullet). However, it is noted that

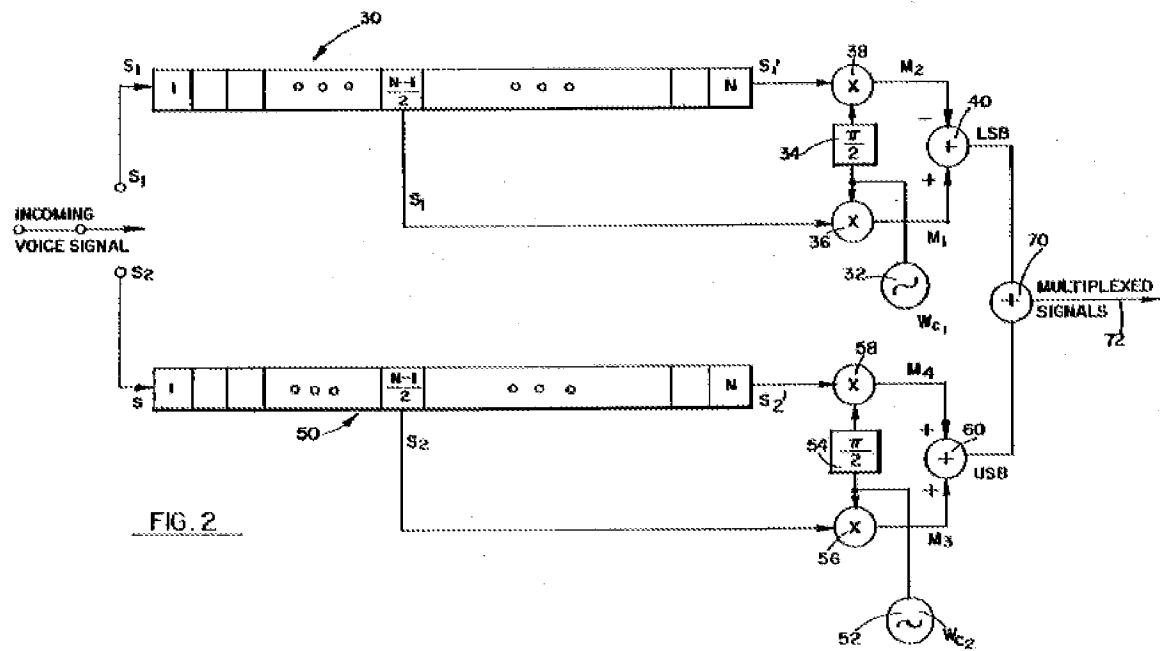
Daoud illustrates in Fig. 2 that the signal produced by SSB modulator 50 (as characterized in the Office Action) and output by summer 60 is the USB signal, as indicated by the label "USB" on the output of summer 60 (see Daoud col. 4, lines 27-30).

Based on the Office Action's misconstruction of which of Daoud's modulators produces the LSB signal and which produces the USB signal, the Office Action concludes that the carrier frequency used to generate Daoud's LSB signal is higher than the frequency used to generate Daoud's USB signal.

Examiner's response: In the last office action mailed on 5/11/2010, the modulators 30 and 50 were incorrectly cited (typographical error). However, the last office action clearly disclosed that S2 (interpreted to be first symbol) obtains an upper side band (USB) signal and S1 (interpreted to be second symbol) obtains a lower side band (LSB) signal. Also the text in column 2, lines 29-24 of Daoud which was cited indicated in the last office action clearly shows support for the last office action position. Moreover, in column 4, lines 38-49, Daoud explicitly discloses that "Preferably the frequency of the second carrier signal wc2 used in the upper sideband generator is slightly higher than the frequency of the first carrier signal wc1 used in the lower sideband generator, so there is a frequency gap between the lower sideband signal and the upper sideband signal". The teachings of figure 2 and column 2, lines 29-47 and column 4, lines 38-49, clearly teaches the claimed limitation of claim 1 "a first frequency-increasing single side band (SSB) modulator that performs SSB modulation on a first input symbol to obtain an upper side band (USB) signal; a second

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frequency-increasing SSB modulator that performs the SSB modulation on a second input symbol to obtain a lower side band (LSB) signal; and a combiner that combines the USB signal and the LSB signal, wherein the second frequency-increasing SSB modulator performs SSB modulation to obtain the LSB signal using a carrier frequency, the carrier frequency being higher than a carrier frequency used in the first frequency-increasing SSB modulator by a fundamental frequency of the first input symbol and the second input symbol".



(2) Applicant's argument: "By using a higher carrier frequency to obtain an LSB signal than that used to obtain a USB signal, as recited in Applicants' claim 1, the LSB signal may be shifted along the frequency axis so as to overlap, along the frequency axis, the USB signal, as illustrated in Applicants' Fig. 4D, for example".

Examiner's response: In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the LSB signal may be shifted along the frequency axis

so as to overlap, along the frequency axis, the USB signal) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

(3) Applicant's argument: "By contrast to the disclosures of Daoud and Muzzi, the Applicants' claimed subject matter frequency shifts the LSB signal into the same frequency spectrum used by the USB signal so that both signals may be conveyed in half the bandwidth required than if the LSB signal were not shifted along the frequency axis".

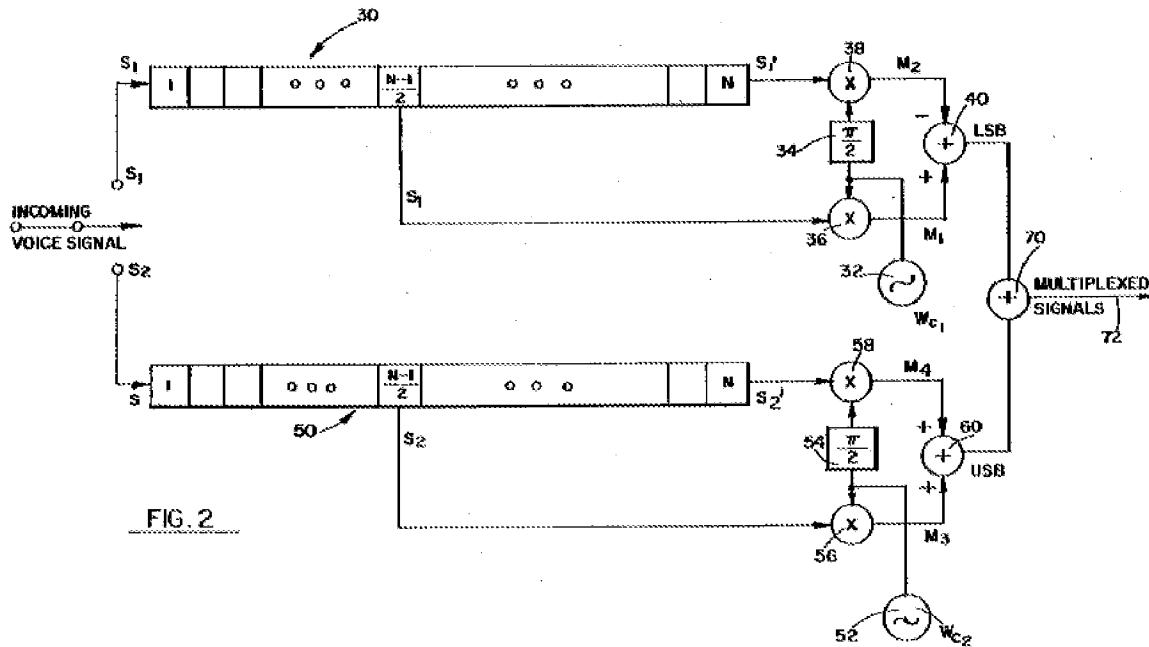
Examiner's response: In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., **frequency shifts the LSB signal into the same frequency spectrum used by the USB signal so that both signals may be conveyed in half the bandwidth required than if the LSB signal were not shifted along the frequency axis**) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1, 4, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daoud et al. (US 4835791) (disclosed in the IDS filed on 01/23/2006) (hereinafter Daoud) in view of Muzzi et al. (US 3628155) (hereinafter Muzzi).**



Regarding claims 1 and 4:

As shown in figures 1-3, Daoud disclose a modulation apparatus comprising:

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- a first frequency-increasing single side band (SSB) modulator (**50 in figure 2**) that performs SSB modulation on a first input symbol (**S2 in figure 2**) to obtain an upper side band (USB) signal (**USB in figure 2**) (**col 2, lines 29-47**);
- a second frequency-increasing SSB modulator (**30 in figure 2**) that performs the SSB modulation on a second input symbol (**S1 in figure 2**) to obtain a lower side band (LSB) signal (**LSB in figure 2**) (**col 2, lines 29-47**); and
- a combiner (**70 in figure 2**) that combines the USB (**USB in figure 2**) signal and the LSB signal (**LSB in figure 2**) (**col 2, lines 29-47**),
- wherein the second frequency-increasing SSB modulator performs SSB modulation to obtain the LSB signal using a carrier frequency, the carrier frequency being higher than a carrier frequency used in the first frequency-increasing SSB modulator by a fundamental frequency of the input symbol and the second input symbol (**col 4, lines 38-49**).

Daoud discloses all of the subject matter as described above including a multiplexing summer (**70 in figure 1**) which produces multiplexed signals (**see the output of the summer 70 in figure 1**) except for specifically teaching such that the LSB signal and the USB signal are multiplexed in the same frequency band.

However, Muzzi in the same field of endeavor teaches such that the LSB signal and the USB signal are multiplexed in the same frequency band (**figure 4, 17 in figure 8, col 2, lines 16-28**).

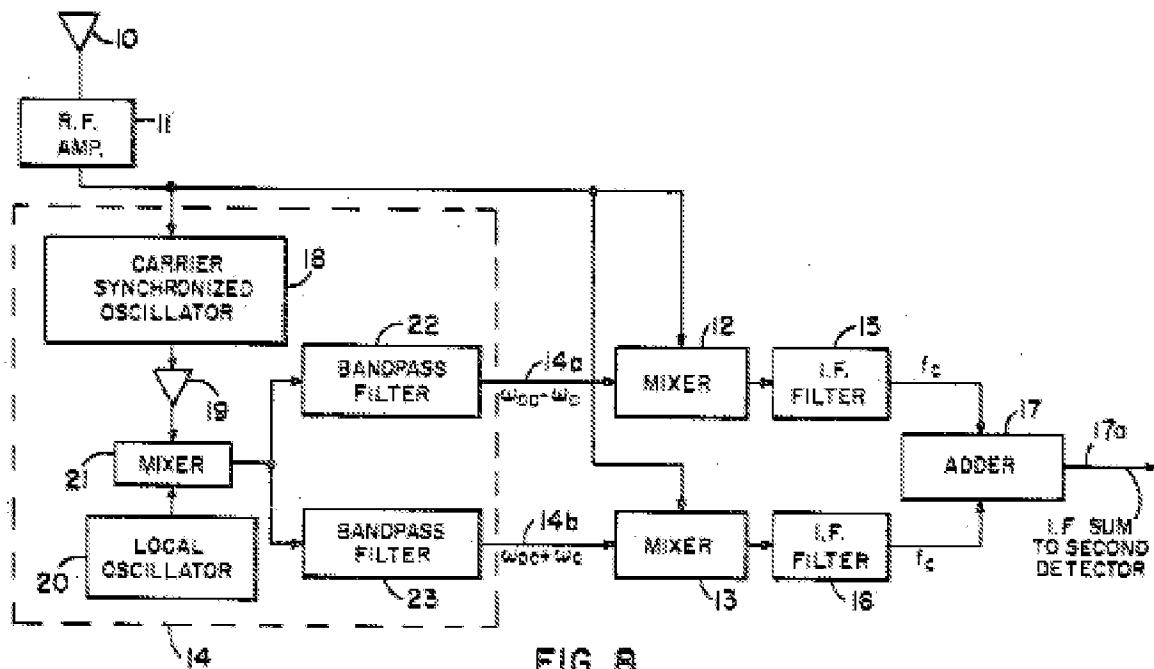


FIG. 8

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to substitute the summer as taught by Muzzi to for the summer of Daoud in order to obtain predictable results (**KSR – simple substitution of one known element for another to obtain predictable results**).

Regarding claims 6 and 8:

Daoud further disclose demodulation apparatus (**see figure 3**) for demodulating a signal combined by the combiner (**70 figure 2**) in the modulation apparatus (**see figure 2**) according to claim 1, the demodulation apparatus comprising:

- a first frequency-decreasing demodulator (**82, 86, and 90 in figure 3**) that demodulates an input modulation signal by a cosine curve with a first carrier frequency (**W_{c1} in figure 3**) to obtain a first demodulation signal (**see the first demodulation signal provided by first demodulator in figure 3**) (col 4, lines 38-49, col 5, lines 43); and

- a second frequency-decreasing demodulator (**84, 88, and 92 in figure 3**) that demodulates the input modulation signal by a sine curve with a second carrier frequency (**W_{c2} in figure 3**) to obtain a second demodulation signal (**see the output of 84, 88, and 92 in figure 3**), wherein
- the second carrier frequency (**W_{c2} in figure 3**) is higher than the first carrier frequency (**W_{c1} in figure 3**) by the fundamental frequency of the first input symbol (**S2 in figure 2**) and the second input symbol (**S1 in figure 2**) (**see the second demodulation signal provided by second demodulator in figure 3**) (**col 4, lines 38-49, col 5, lines 43**).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to KABIR A. TIMORY whose telephone number is (571)270-1674. The examiner can normally be reached on 8:00 AM - 4:30 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kabir A Timory/
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611